REPORT OF THE ARMY SCIENTIFIC ADVISORY PANEL AD HOC GROUP ON ENVIRONMENTAL QUALITY CONTROL

Army Scientific Advisory Panel
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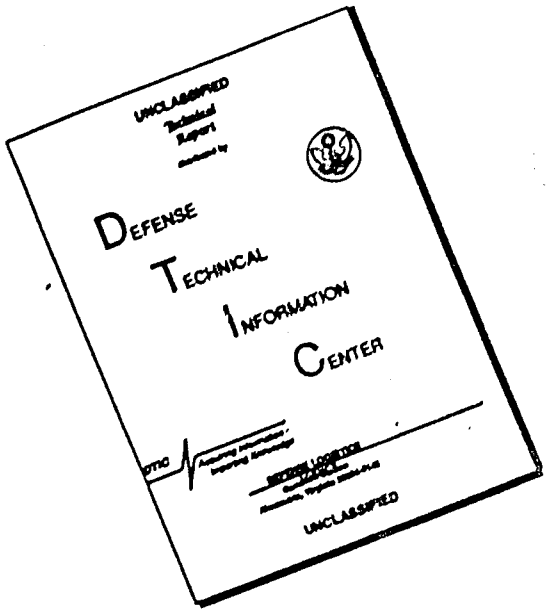

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REPORT

OF THE

ARMY SCIENTIFIC ADVISORY PANEL

AD HOC GROUP

ON

ENVIRONMENTAL QUALITY CONTROL

DISTRIBUTION STATEMENT:

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NOTE: This report represents the status of the organization, mission and objectives of the Army Environmental Quality Research Program as of 1 September 1974. We feel that this program review has been timely and we hope that our comments have been instrumental in producing some of the changes that have already occurred in the program.

SUMMARY

After reviewing the Army Environmental Quality Control (EQC) R&D Program, the Ad Hoc Group makes the following recommendations derived from the discussions and conclusions contained within the report.

1. Environmental Quality Control is here to stay and the Army must plan, on a long term basis, to include EQC as a program component.

2. The Army should recognize that meeting national leadership objectives in EQC and the establishment of a viable long-range R&D program to solve Army-unique EQC problems are separate and distinct problems requiring separate action programs.

3. The Army should in some manner further emphasize the role of the OCE as the executive staff management office for a national leadership objective EQC program and charge to each such program the full cost for appropriate environmental control.

4. The Army should utilize the full range of information and resources that have been developed from the national EQC program to solve Army problems which have a civilian analog.

5. The Army should develop a long-range EQC R&D program based on logical program elements and seek adequate funding.

6. A standard categorization should be established for Army EQC R&D efforts and a level between 5% and 30% of total funding might prove appropriate.

7. The Army should fully support the assignment of overview responsibility for the total EQC R&D program to OCE and charge that group with the responsibility for the timely preparation of a five year plan.

8. The Army should guard against tasking the EQC R&D program with non-R&D tasks.

9. The present funding level of approximately $10 million should not be changed more than 50% in either direction until the five year program has been developed and approved.

10. The Army must anticipate the trend toward more stringent permissible pollution levels and evaluate its R&D program on this basis.

11. The program reviews of new construction, should include evaluation of the adequacy of the EQC measures, their development and their design.

12. The Army should initiate a five year plan to upgrade its existing facilities.

13. The actions taken to date to minimize pollution from TNT plants should be reviewed together with their justifications. A separately funded ad hoc program to reduce this pollution to acceptable levels should be implemented. A plan should be organized within six months. The design specifications should be laid out within 30 months and the complete plan implemented before 1979.

14. The current level of EQC R&D program reporting is deemed adequate and need not be increased.

15. The current programs seem well balanced between in-house and contractor-research but continued attention is required to make the appropriate changes and to maintain a proper balance as program emphasis changes.

16. The Army deserves praise for its contributions in reduction of automotive air pollution; however, since this program is now funded at high levels by non military agencies, the need for Army pioneering should lessen.

17. The potential problem of growing dependence of Army laboratories on outside funding is an appropriate area for DA Staff level concern and is not fundamentally a technological issue.

18. The Army EQC activity should consider the creation of a semi-permanent technical advisory group.

19. Appropriate fundamental research and measurement involving 6.1 funds as well as 6.2 should be appropriated to adequately cope with Army unique EQC problems.

20. The new effort described as opportunity assessment should be immediately incorporated into the Army EQC R&D program.

Report of Army Scientific Advisory Panel Ad Hoc Group on Environmental Quality Control

I. INTRODUCTION

A. Terms of Reference and Background.

In response to an increasing national environmental awareness and to legislative and regulatory mandates, the Army initiated an Environmental Quality Control (EQC) Research and Development program, with separate identifiable efforts. This program was initiated in FY 72 and the funding level of the program has grown to over $10 million for FY 75.

Because of deadlines imposed by these legislative and regulatory mandates to curtail or reduce pollution levels in specific areas and specific facilities, the initial thrust of the program was devoted to finding quick solutions to the immediate problems. However, the effort has now progressed to the point that a more orderly and reasonable approach to the program should be pursued.

In view of the above, an ASAP Ad Hoc Group was established to review the Army's EQC Research and Development Program. The Ad Hoc Group was tasked with considering the following:

1. Research requirements which must be satisfied to permit the Army to respond to pollution abatement schedules in a cost effective manner.

2. The assessment of technology available from other sources.

3. Match up of the current program to those requirements in 1 not satisfied by 2.

4. Identification of gaps, overlaps and recommended changes in emphasis.

5. Evaluation of productivity of current Army Research [illegible] mental control and pollution abatement.

However, since the Ad Hoc Group was formed, the Department of the Army has undergone a reorganization. The continuance of the program and focal point for the overall responsibility has been given to the Corps of Engineers. While this has redefined and focused environmental [illegible]

control responsibility and should, in conjunction with the Army Environmental Council and the Army Environmental Committee, lead to some resolution of the Army's environmental quality control efforts, the functioning of these organizations in today's situation is too new to permit detailed evaluation.

B. Overview of the Problem.

In the direction of its EQC programs, it is essential that the Army differentiate between two quite different objectives and the actions required to meet these objectives. One objective is quite general: to show national leadership by doing an exemplary job in the EQC area. The other objective is much more specific: to conduct those R&D programs required to resolve Army-unique EQC problems. The question often raised about whether or not the Army should parallel or duplicate the environmental control work of other agencies or of commercial firms is a moot issue - the Army does not have the resources. The Arm must, in fact, strive to make maximum use of the efforts of others.

The national leadership objective can best be achieved by making EQC a part of the Army general professional conduct. Appropriate actions which would encourage progress in this direction include:

- Command promulgation of environmental quality concern as a part of professional conduct.
- Circulation throughout the Army of available information on techniques and processes for pollution control.
- Establishment of an award/reward system for pollution control innovations.
- Introduction of environmental control courses in appropriate Army instruction programs.
- Preparation of exemplary impact statements and scrupulous observance of legislative and regulatory mandates.
- Adequate recording and reporting of Army efforts to achieve a high level of environmental quality control.

Achieving the quality of performance which would be exemplary must be the responsibility of individual Army activities. The EQC measures

required should be internalized as a cost associated with each activity. Like safety, good environmental control cannot be an add-on program left to others.

The Army EQC R&D program, the second objective noted above, is amply justified by the fact that the Army encounters some problems and materials which are unique to the military services. It should truly be an R&D program seeking to achieve understanding where neither existing knowledge nor non-Army programs provide the understanding required to meet acceptable standards.

It cannot be denied that the resolution of the more general problems referred to above under national leadership objectives are important and deserve Army attention. Internalization of the costs within specific programs should determine their management and funding. It is the Army R&D program which has been the specific aspect of the Army's EQC problem on which this committee has primarily focused its attention in view of the dominant aspect of basic science judgments in this area.

C. Report Content.

In Section II we will discuss the areas of concern that were apparent to this Ad Hoc Group. Section III contains the Ad Hoc Group's views on the content and structuring of the Army's EQC R&D Program. Section IV summarizes the Army organizations involved in the EQC Program. The conclusions and recommendations are presented in the last section, Section V.

The Ad Hoc Group thanks the Army elements that have provided us with the necessary information and have made the performance of our task possible. In particular the Corps of Engineers, Research and Development Office, Edgewood Arsenal and the Surgeon General. Also, we wish to thank Major Jerry Gregg and Mr. Tom Flowe who served as our military assistants.

II. AREAS OF CONCERN

The United States Army has had a continuing effort in pollution abatement for many years. It has always been concerned about the health and hygiene of the soldier and the proper care of his facilities. Personal hygiene and cleanliness are one form of environmental quality control. The Army has always had regulations about proper waste disposal. However, there has been recent emphasis and prominence given to EQC because of changes in public attitudes and their reflections in executive

policy. In response the Army created a new program element. The objective of this program element is to give visibility, control and emphasis to Army programs which are directly related to EQC. In the future it is likely that additional concerns such as those relating to energy conservation will further constrain EQC activities. However, EQC will remain an area of concern for the foreseeable future.

After reviewing the EQC Program, the ASAP Ad Hoc Panel wishes to point to the following areas of concern where potential problems may lie in the future.

A. There seems to be a lack of definition of RDT&E versus OMA tasks. Many of the program elements now being supported out of RDT&E funds should actually be supported by the operational costs of other programs. For example, developing proper methodologies to measure the impact of Army facilities, testing and field exercises on the ecology is a RDT&E cost. However, the surveillance of facilities and the routine environmental assessments which must be made by the installation engineer does not constitute RDT&E. The cost of such activities should be borne by OMA funds. A second example where funds should not be supplied by the EQC program involves the testing of new equipment for conformity with EQC regulations. For example, when the Army designs and produces new internal combustion engines the testing of these devices will require routine measurements of gas emissions. Such costs should be borne by the engine development program and not EQC. Proper design and fabrication of the testing methodology routines to be used in the emission testing of new engines is bonafide RDT&E in EQC.

B. The U. S. Army has many areas where it must solve unique pollution abatement problems. The Army itself must carry out the R&D projects to solve these problems. The three areas which were immediately obvious to the committee are:

1. Munitions manufacturing, storing and disposing. Since the United States Army is responsible for the manufacturing of all explosives and the loading of large quantities of munitions for all the services there are many related pollution problems. The most visible of these at the present time is the so-called "pink-water problem." Small quantities of the nitrated toluenes are introduced into stream waters near manufacturing facilities. As a result of photochemical action these derivatives undergo a chemical reaction and produce red compounds which are clearly visible. Also in the selliting step, sodium sulfite is added to crystallize out some of the unwanted nitro compounds. These sulfites form red derivatives which can be returned to the streams. Even if TNT and the photolysis products were biodegradable and were innocuous to

the environment, (such may not be the case), there would still be a serious public relations problem with neighboring municipalities which must be solved.

There are two other munitions related areas which have not been given such close scrutiny: the storage of munitions and their proper disposal. Furthermore, most loading and storing facilities are plagued with large droppings of explosives which may be washed through the soil and finally may reach streams and areas outside of the government facility. Burning is often used to dispose of unwanting munitions. Any such method must give effluents which may or may not be noxious.

2. Pesticide and Chemical Agent Disposal. The United States Army presently has in stock large quantities of pesticides and chemical agents which are scheduled for disposal. At the present time there are no totally acceptable methods of disposing of these chemicals. For example, if they were buried they could gradually permeate the area and be carried by ground water into our streams and oceans. Obviously some method to convert them to nontoxic substances should be sought.

3. Field Manuevers and Operations. If the Army is to maintain a viable force, it must be allowed to exercise and train its troops in the field under realistic conditions. These operations may vary in size and complexity from simple company level exercises to large division field exercises. It is clear that exercises of this type have effects on the local environment. The severity of the environmental impact varies from foot trampling of the normal native vegetation to the digging of latrines and human waste facilities, from the digging of fox holes and bunkers to the generation of large quantities of automotive effluents and the possible pollution of streams. It is not clear to the panel that much time or effort has been spent in evaluating the impact of such field exercises on the environment. The return of Army areas such as firing ranges to private use is yet another aspect of this problem.

C. Army Significant Problems. There are also numerous areas where the Army has problems not unlike those of nonmilitary organizations. The Army spends approximately 1.3 billion dollars a year to maintain its active and inactive facilities in CONUS and overseas commands. Of this 6.2% is used for handling and disposal of refuse, solid and liquid waste, pest control, and snow removal. This does not include new construction of sewage plants, filtration units, etc. Hence the Army has an enormous fiscal interest in reducing the cost of its upkeep. This problem is closely linked with environmental control. If the United States Army can substantially reduce its refuse it could save appreciable amounts of money

which could then be better spent in training or in troop commands. How much money the Army can save by reducing its waste has not been analysed.

D. Lack of Total System Approach. A total system approach to EQC should be considered by the Army. Such an approach may be applied to both Army unique and Army significant problems.

For example, with respect to the Army manufacturing and processing plants two approaches might be taken. Present plant processes might be kept as they are and all cooling waters might be purified before returning to the streams. However, if modifications to the processes are possible. which eliminate the need for further filtration, the total Army cost might be less.

Divided responsibilities are an impediment to taking this approach. For example the Army Materiel Command Government Owned, Contractor Operated (GOCO) facilities are often designed with one group striving to reduce processing cost and another trying to minimize the cost of water purification. Both process changes can heavily impact purification problems. Obviously the correct approach should be decided after considering the overall costs to the Army.

A system approach would evaluate the opportunities and costs of preventing waste generation and weigh these against the cost of disposal using environmentally acceptable techniques. With respect to refuse disposal, by reducing packaging requirements on certain goods a large volume of refuse might be eliminated. At the present time certain goods must be packed for long shelf life though it is known a priori that the goods are to be used in the very near future. Hence there is a tremendous waste in time and effort and an increased amount of refuse generated.

2. Administrative Procedures. There is concern that Army efforts to date in the EQC management area have focused excessively on the perfection or extension of reporting procedures rather than on substantive problems. While it is clearly necessary to maintain adequate records and to understand the current status of Army EQC programs, these efforts will not lead, in and of themselves, to improved performance or applicability. What is most apparent by its absence is an adequate DA approved long-term plan or a set of milestones against which program progress may be judged and priorities established. Furthermore, it appears that the lines of responsibility are relatively unclear in the R&D program justification area. It seems impossible to perceive at this time any orderly evaluative process within the Army for assigning priorities to the diverse requests for EQC R&D Funds.

F. Unnecessary Duplication of Effort. There is always serious concern whether the U. S. Army Labs are unnecessarily duplicating efforts in other non Army laboratories or even that there may be an unnecessary duplication of effort among different laboratories within the U. S. Army laboratory system.

G. Lack of Basic Knowledge About Fundamental Chemistry. There is concern that the U. S. Army is not allocating sufficient funds to perform fundamental research in Army unique areas. For example, when the first efforts were made to eliminate the pink water problem, it was discovered that very little was known about the photochemistry of nitro toluene. When enormous quantities of TNT are produced annually, with PEMA funding, why was not a commensurate amount of 6.1 and 6.2 funding allocated? If research had been funded at that time, the fundamental knowledge would be available to solve the pink water problem and to carry out the suggested system analysis on the TNT process.

H. Possible Impact on Army Effectiveness. The Ad Hoc Group is also concerned about the impact of the present new pollution abatement regulations upon the Army's effectiveness in peace and war. The present remedies needed to reduce effluents from Army vehicles results in much higher fuel consumption. Hence the Army has to increase its logistic train for the same job. Of course this can have deleterious effects on the Army effectiveness.

III. ARMY R&D PROGRAM ANALYSIS

As a result of its survey of Army R&D activities in environmental quality control, the committee observes that six categories might well be utilized to classify the appropriate areas of Army R&D efforts. Examples are included for illustrative purposes only, and do not imply a recommendation for the specific tasks listed.

A. Toxicology Measurements. To determine acceptable levels of possibly toxic materials unique to the Army environment or operations. Examples are:

1. In plant acceptable maximum vapor concentration of explosive degradation products.

2. Toxic effects of explosive degradation gases built up in APC's, helicopters and firing ranges.

3. Toxic levels of waste products of explosive production facilities.

4. Toxic levels of components used in the binary Chemical Warfare (CW) systems.

B. Instrument Development - To design, test or evaluate instruments offering a level of precision, cost, or ease of maintenance required by the Army and not otherwise available.

1. Evaluation of instruments to measure gas pollutants such as riot control agents.

2. Design of instruments to measure low levels of phosphines and other reagents used in the binary CW munition systems.

3. Design and evolution of instruments to measure low level chemical agents concentration along the perimeter of toxic chemical storage areas.

C. Design of Ecology Status Surveys - Development and validation of methodology required to assess the impact of Army operations on the environment.

1. Development of Edgewood Ecology Survey guidelines for AMC installation environmental assessments.

2. Development of Corps of Engineers Handbook for Environmental Impact Analysis.

D. Process or Product-Specific Basic Research - Studies to achieve an acceptable level of understanding of phenomena of a broad generic character involved in a multiplicity of Army operations.

1. Systems approach to new synthesis of TNT to minimize pollution effects.

2. Possible selection of another explosive in lieu of TNT.

3. Study of the chemical reaction rates in rocket propellant combustion processes.

E. Opportunity Assessment - Studies to determine the nature and extent of the Army's detrimental environmental impact so as to highlight areas deserving greater attention or representing major opportunities for effective action.

1. Packaging for long shelf life though it is known a priori that the goods are to be used in the very near future.

2. Investigation of alternate plant sites to take advantage of large stream flows.

F. Decontamination or Demilitarization - Studies directed toward techniques for disposing of hazardous materials, detoxifying contaminated equipment or areas, recovering or nullifying the results of warfare or preparing an area for return to civilian use.

1. Disposal of surplus pesticides and chemical agents.

2. Disposal of outdated munitions.

3. Clearing of firing ranges for return to public use.

Detailed analysis of suggested programs, the importance of the issues which they are intended to resolve, and the availability of manpower and facilities would be required to establish the relative dollar allocations which would be appropriate amongst these programs. Initial results from an opportunity assessment (category E above) would be especially helpful in making such decisions.

Use of the classification scheme defined above, or some analysis set of categories, could be of great value in giving a comprehensible shape and form to the Army EQC R&D program. Furthermore, analysis using such a set of categories should make it easier to achieve reasonable objectives such as:

a. balanced expenditure of funds

b. assessment of resources

c. focusing of emphasis

d. elimination of duplication

In the absence of an analysis within such a framework it is most difficult to evaluate the existing or planned Army EQC R&D program with respect to just the qualities noted above.

In addition, the establishment of such a set of defined categories and a requirement that all suggested R&D programs be analyzed in these terms would help to exclude inappropriate activities from R&D funding.

IV. CONCLUSIONS AND RECOMMENDATIONS

1. CONCLUSION: Environmental Quality Control (EQC) is here to stay. It is the conclusion of this Group that the Army will continue to have to meet restrictions on pollution and effluent emissions for many years to come.

- RECOMMENDATION: The Army must therefore plan, on a long term basis, to include EQC as a program components.

2. CONCLUSION: The Army has two different problems in EQC. First, the Army has a problem of meeting a national leadership objective by including EQC, as it does safety programs, as an element of command responsibility at all levels. Such an objective can be met through command channels as outlined in the report. Second, and more important for the purpose of this report, the Army has a problem of establishing a long-range R&D program to solve Army-unique problems within the Army R&D program.

- RECOMMENDATION: The Army should recognize that the separate nature of these two problems requires two separate action programs

3. CONCLUSION: The achievement of the national leadership objective in EQC requires emphasis on operation funding, and implem ntation, not R&D.

- RECOMMENDATION: The Army sh uld in some manner further emphasize the role of the OCE as the executive staff management office for a national leadership objective EQC program, and charge to each such program the full cost for appropriate environmental control.

4. CONCLUSIONS: EQC is a national problem and attention is being given to many problems not significantly different from those being encountered by the Army.

- RECOMMENDATION: The Army should utilize the full range of information and resources that have been developed from the national EQC program to solve Army problems which have a civilian analog.

5. CONCLUSION: To solve Army-unique problems, the Army has a need for a long-range internal R&D program targeted on its own unique problems. Such a program will not be easy to develop and fund, but must be created logically and rationally if the effort is to succeed. ACP #42 does not provide adequate guidance or detail to serve this purpose.

- RECOMMENDATION: The Army should develop a long-range EQC R&D program based on logical program elements, and seek adequate funding.

6. CONCLUSION: EQC R&D program analysis requires a definition and categorization such as that exemplified by the six category approach suggested in Section III of this report. Research in each of these categories is important to future Army EQC.

- **RECOMMENDATION: A standard categorization for Army EQC R&D efforts should be established and, in terms of the categories suggested in Section III, a level between 5% and 30% of total funding might prove appropriate.**

7. CONCLUSION: **The whole Army EQC program has lacked an adequate broad and strong management focus. Recent reorganization to charge OCE with an overview responsibility which encompasses AMC, TSG and OCE environmental activities is an appropriate step. Many of the recommendations presented in this report should be implementable with this new structure through appropriate guidelines. An important responsibility for the overview group should be the preparation of a five year plan for DA approval and acceptance.**

- RECOMMENDATION: **The Army should fully support the assignment of the overview responsibility for the total EQC R&D program to OCE and charge that group with the responsibility for the timely preparation of a five year plan.**

8. CONCLUSION: **EQC concerns and problems generate a high level of emotional response on the part of the public and considerable public relations pressure for immediate corrective actions, many of which actions are not R&D in nature.**

- RECOMMENDATION: **The Army should guard against tasking the EQC R&D program with non R&D tasks.**

9. CONCLUSION: **R&D by the Army can ultimately only be justified by its contribution to reducing the cost of Army operations while maintaining acceptable standards. The adequacy of R&D funding can only be judged in terms of its ability to achieve this goal over relative lengthy periods and therefore is tied to the development of a DA approved EQC R&D plan encompassing all relevant Army activities.**

- RECOMMENDATION: **The present funding level of approximately $10 million should not be changed more than 50% in either direction until the five year program has been developed and approved.**

10. CONCLUSION: **EPA standards are in state of continued flux. Permissable pollution levels are becoming more stringent each year. In fact, these levels seem most dependent on our ability to measure these levels through improved instrument sensitivity.**

- RECOMMENDATION: **The Army must anticipate this trend and evaluate its R&D program on this basis.**

11. CONCLUSION: Construction programs such as the design of TNT plants, chemical agent production, etc., are notably deficient in allocating funds for appropriate EQC. Research and development programs are not appropriate sources of these funds.

- RECOMMENDATION: The program reviews of new construction should include evaluation of the adequacy of the EQC measures, their development and their design.

12. CONCLUSION: The Army EQC Program seems to be driven by crises rather than by a plan. Action taken under crisis conditions frequently suffers from inadequate planning and is accomplished only at greatly increased cost. The review suggested above which focuses on new construction would not discuss these needs.

- RECOMMENDATION: The Army should initiate a five year program to upgrade its present facilities.

13. CONCLUSION: Whether purple, red, or pink, the polluted water from TNT plants is still with us today.

- RECOMMENDATION: The actions taken to date should be reviewed together with their justification. A separately funded ad hoc program to reduce this pollution to acceptable levels should be implemented. A plan should be organized within six months. The design specifications should be laid out within 30 months and the complete plan implemented before 1979.

14. CONCLUSION: There is today a tendency to focus increasing efforts within the Army EQC R&D program on the preparation of reports and the assembly of data. This can and often does reduce the efforts which can be devoted to the more substantive and important tasks of gaining significant new data and understanding and the establishment of program objectives.

- RECOMMENDATION: The current level of EQC R&D program reporting is deemed adequate and need not be increased.

15. CONCLUSION: Present EQC problems involve diverse phenomenology and require many scientific disciplines for the resolution. Because many of the areas of research and technology are highly specialized, it is not feasible to maintain in-house expertise in all of these areas.

- RECOMMENDATION: The current programs seem well balanced between in-house and contractor research, but continued attention is required to make the appropriate changes and to maintain a proper balance as program emphasis changes.

16. CONCLUSION: The U. S. Army has long had a vigorous program in vehicular engine design and it has supplied some badly needed leadership in emission control and reduction. However, a general national effort is now underway to solve the automative air pollution program.

- RECOMMENDATION: The Army deserves praise for its contributions in this area; however, since this program is now funded at high levels by non military agencies, the need for Army pioneering should lessen.

17. CONCLUSION: Army laboratories are presently being offered opportunities to provide service functions under funding from other agencies. This allows the Army laboratories to maintain an increased breadth and depth, but there may be a growing dependence of these laboratories on the continuation of outside funding.

- RECOMMENDATION: This problem is appropriate for DA Staff level concern and is not fundamentally a technological issue.

18. CONCLUSION: The whole EQC area not only involves a wide range of technology but is also subject to rapid change. Program evaluations and modifications are likely to be required frequently during the next few years to properly reflect new understanding, requirements, and problems. The Army should seek help in the program planning and evaluation areas and even seek to create outside interest in its key technical problems.

- RECOMMENDATION: The Army EQC activity consider the creation of a semi-permanent technical advisory group.

19. CONCLUSION: Related to many Army unique EQC problems there is a need for fundamental research and measurements. For example, the photolysis of TNT was never studied prior to the pink water problem.

- RECOMMENDATION: To effect such appropriate research, 6.1 funds as well as 6.2 should be appropriated to do the research required to adequately cope with Army unique EQC problems.

20. CONCLUSION: There is a need for a total systems approach to examine all aspects of EQC related problems and to evaluate the cost alternatives and opportunities available to the Army.

- RECOMMENDATION: The new effort described as opportunity assessment should be immediately incorporated into the Army EQC R&D Program.

MEMBERSHIP AND AGENDA

1. Membership -

Chairman	Dr. Robert A. Beaudet University of Southern California, Department of Chemistry. University Park, Los Angeles California 90007
Members	Dr. Marvin R. Gustavson Lawrence Radiation Laboratory P. O. Box 808 Livermore, California 94550
	Dr. Herbert L. Ley, Jr. 9209 Friars Road Bethesda, Maryland 20034
	Dr. James J. Renier Honeywell Incorporated 2701 Fourth Avenue, South Minneapolis, Minnesota 55408

2. Agenda

DATE	SUBJECT
27-28 February 1974	Army Environmental Quality Research Program Review
13 March 1974	U. S. Army Medical R&D Command Environmental Quality Program Review
13 June 1974	AMC Pollution Abatement & Environmental Control Technology Technical Advisory Board Meeting
19 August 1974	Draft Report Preparation
14 January 1975	Final Report Preparation

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b. Letter EPA to USMRC, 26 November 1973, subject: Aquatic Ecosystem Simulator.

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e. Letter from Commander, U. S. Army Medical Bioengineering Research and Development Laboratory to HQDA(SGRD-DO) 7 March 1974, subject: Schedule X Environmental Quality Division.

f. Standard Form 33, Solicitation No. RFP DAMD 17-74-R-4755, subject: Munitions Compounds Aquatic Toxicity Study, issued 15 March 1974.

g. USAMEERU Report No. 73-07, Munition Production Products of Potential Concern as Waterborne Pollutants - Phase I, June 1973, U.S. Army Medical Environmental Engineering Research Unit, Edgewood Arsenal, Md.

APPENDIX II

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l. Protocol for Evaluating the Effects of Munition Waste on Aquatic Life, 17 December 1973; J. Cairns and K. Dickson.

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n. Background Paper - Recommended Course of Action on Environmental Quality Standards Research, by Major L. H. Reuter, October 1973.

o. Letter SGRD-LD to HQDA(DARD-ZA), 9 August 1973, subject: Request for Approval of a Class Determination and Findings - Munitions Wastes Toxicity Research (3 Inclosures).

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